

Claims

1. An expandable stent comprising:

a plurality of serpentine ring structures, each of said ring structures comprising at least one unit structure, wherein said at least one unit structure comprises a plurality of bends at least some of which are key-hole shaped and positioned in a staggered arrangement to avoid abutment of the key-hole shaped bends against one another when the stent is in an unexpanded state, and a plurality of strut members, wherein each of said key-hole shaped bends has a first end connected to one of said strut members and a second end connected to another of said strut members; and

at least one connector member joining two of said ring structures, said at least one connector member having a first end joined to a peak of one of said bends of one of said two ring structures and a second end joined to a peak of one of said bends of the other of said two ring structures.

2. The expandable stent of claim 1, wherein said bends which said connector member is joined to are key-hole shaped.

3. The expandable stent of claim 1, wherein each unit structure of each of said plurality of ring structures is in communication with at least one connector member.

4. The expandable stent of claim 1, wherein there are two or more connector members joining said two ring structures and said connector members are circumferentially aligned.

5. The expandable stent of claim 1, wherein adjacent ring structures are axially aligned.

6. The expandable stent of claim 1, wherein some adjacent unit structures are joined together by first and second substantially straight tie-bars.
7. The expandable stent of claim 6, wherein said plurality of bends
5 are positioned substantially between said first and second substantially straight tie-bars.
8. The expandable stent of claim 1, wherein said at least one connector member is one of U, V, and W shaped.
9. The expandable stent of claim 1, wherein said unit structure
10 comprise three key-hole shaped bends.
10. The expandable stent of claim 1, wherein two of said strut members form a substantially V-shape.
11. The expandable stent of claim 1, wherein said at least one connector member joins adjacent substantially aligned bends of adjacent ring
15 structures.
12. The expandable stent of claim 1, wherein said ring structures are cylindrical.
13. The expandable stent of claim 1, wherein each of said ring structures comprise an endless pattern of unit structures.
- 20 14. The expandable stent of claim 1, wherein the expandable stent is self-expanding.
15. The expandable stent of claim 1, wherein the expandable stent is adapted to be expanded using a balloon.
16. An expandable stent comprising:

a plurality of cylindrical, serpentine ring structures, each of said ring
structures comprising an endless pattern of unit structures, wherein each of
said unit structures comprise a plurality of strut members and a plurality of
bends at least some of which are key-hole shaped and positioned in a
5 staggered arrangement to avoid abutment of the key-hole shaped bends
against one another when the stent is in an unexpanded state, wherein each
of said plurality of bends communicates with two of said plurality of strut
members, wherein at least two of said unit structures are adjacent and joined
together by first and second tie-bars with said plurality of strut members and
10 said plurality of bends of said at least two adjacent unit structures being
disposed substantially between said first and second substantially straight tie-
bars; and

15 at least one connector member having a curved portion joining two of
said ring structures, wherein said at least one connector member has a first
end joined to a peak of one of said bends of one of said two ring structures
and a second end joined to a peak of one of said bends of the other of said
two ring structures.

20 17. The expandable stent of claim 16, wherein each unit structure of
each of said plurality of ring structures is in communication with at least one
connector member.

18. The expandable stent of claim 16, wherein there are two or
more connector members joining said two ring structures and said connector
members are circumferentially aligned.

19. The expandable stent of claim 16, wherein adjacent ring structures are axially aligned.
20. The expandable stent of claim 16, wherein said unit structure comprise three key-hole shaped bends.
- 5 21. The expandable stent of claim 16, wherein two of said strut members form a substantially V-shape.
22. The expandable stent of claim 16, wherein said at least one connector member joins adjacent substantially aligned bends of adjacent ring structures.
- 10 23. The expandable stent of claim 16, wherein the expandable stent is self-expanding.
24. The expandable stent of claim 16, wherein the expandable stent is adapted to be expanded using a balloon.
- 15 25. The expandable stent of claim 16, wherein said at least one connector member is one of U, V, and W shaped.
26. The expandable stent of claim 16, wherein each of said bends has a first end connected to one of said strut members and a second end connected to another of said strut members.
- 20 27. The expandable stent of claim 16, wherein said bends which said connector member is joined to are key-hole shaped.
28. A method of deploying a stent comprising:
providing an expandable stent comprising: a plurality of serpentine ring structures, each of said ring structures comprising at least one unit structure, wherein said at least one unit structure comprises a plurality of bends at least

some of which are key-hole shaped, a plurality of strut members, wherein each of said bends has a first end connected to one of said strut members and a second end connected to another of said strut members; and at least one connector member joining two of said ring structures, said at least one connector member having a first end joined to a peak of one of said bends of one of said two ring structures and a second end joined to a peak of one of said bends of the other of said two ring structures;

10 crimping the stent to a pre-deployment configuration in which the stent
is in an unexpanded state and the key-hole shaped bends are positioned in a
staggered arrangement to avoid abutment of the key-hole shaped bends
against one another;

delivering the stent into a patient's body to a final destination; and
expanding the stent.

15 29. The method of claim 28, wherein the stent is delivered into said patient's body by advancing a catheter device over a guide wire.

30. The method of claim 28, wherein the stent is expanded using a balloon.

31. The method of claim 28, wherein the stent is self-expanding.

32. The expandable stent of claim 28, wherein some adjacent unit
20 structures are joined together by first and second tie-bars with said plurality of
bends of said some adjacent unit structures positioned substantially between
said first and second tie-bars.

33. The expandable stent of claim 28, wherein two of said strut members form a substantially V-shape.

34. The expandable stent of claim 33, wherein said at least one connector member joins adjacent bends of adjacent ring structures, wherein said adjacent bends are substantially axially aligned.

35. The expandable stent of claim 34, wherein said bends which
5 said connector member joins are key-hole shaped.

36. The expandable stent of claim 28, wherein said at least one connector member is one of U, V, and W shaped.